MURPHY®

PowerView™
Model PV750

Installation and Operations Manual

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time. The latest version of this manual can be found at www.fwmurphy.com.

WARNING

Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT:

Read and follow all installation instructions.

Please contact FW MURPHY immediately if you have any questions.

Table of Contents

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Hardware Installation

The following instructions will guide you through installing the PowerView display.

Inspecting Package Contents

Before attempting to install the product, it is recommended that you ensure all parts are accounted for and inspect each item for damage (which sometimes occurs during shipping). The items included in the box are:

PV750 unit

Installation kit – P/N 78-00-0638 includes:

- 4 ea. machine screws and flat washers

- 4 Nylock nuts

- Installation & Operations manual – P/N 00-02-0686

Dash-Mounted Installation

Tools needed.

- Drill with 5/32" size bit

- Jig Saw

- Wrench or socket 6-32 Nylock nuts (provided) to studs

Preparing the Dash

Determine the location of the PowerView in the dash. Use the Installation Template (included at the end of the manual) as a guideline to cut a hole in the dash to the specified dimensions. Drill holes where indicated on the template for the mounting screws.

> **NOTE**: When using the paper template from the manual, if you downloaded this document from the FW Murphy website, be aware that the pdf file may not automatically print to scale. When submitting the file for print, you will need to select "None" for Page Scaling. Check the accuracy of the printed template by verifying the measurements labeled on the template are correct.
>
> If this manual was supplied with your product, the template will be correct.

Mounting the Unit

1. Place the back side of the display through the opening in the dash.

2. Use the four screws to line up the unit with the drilled holes.

3. Push the unit through the opening and screws through the drilled holes until the back of the case is flush.

4. Use the Nylock nuts provided to tighten unit to the dash. Use the appropriate wrench or socket to tighten. Torque lock nuts to 8-10 inch pounds.
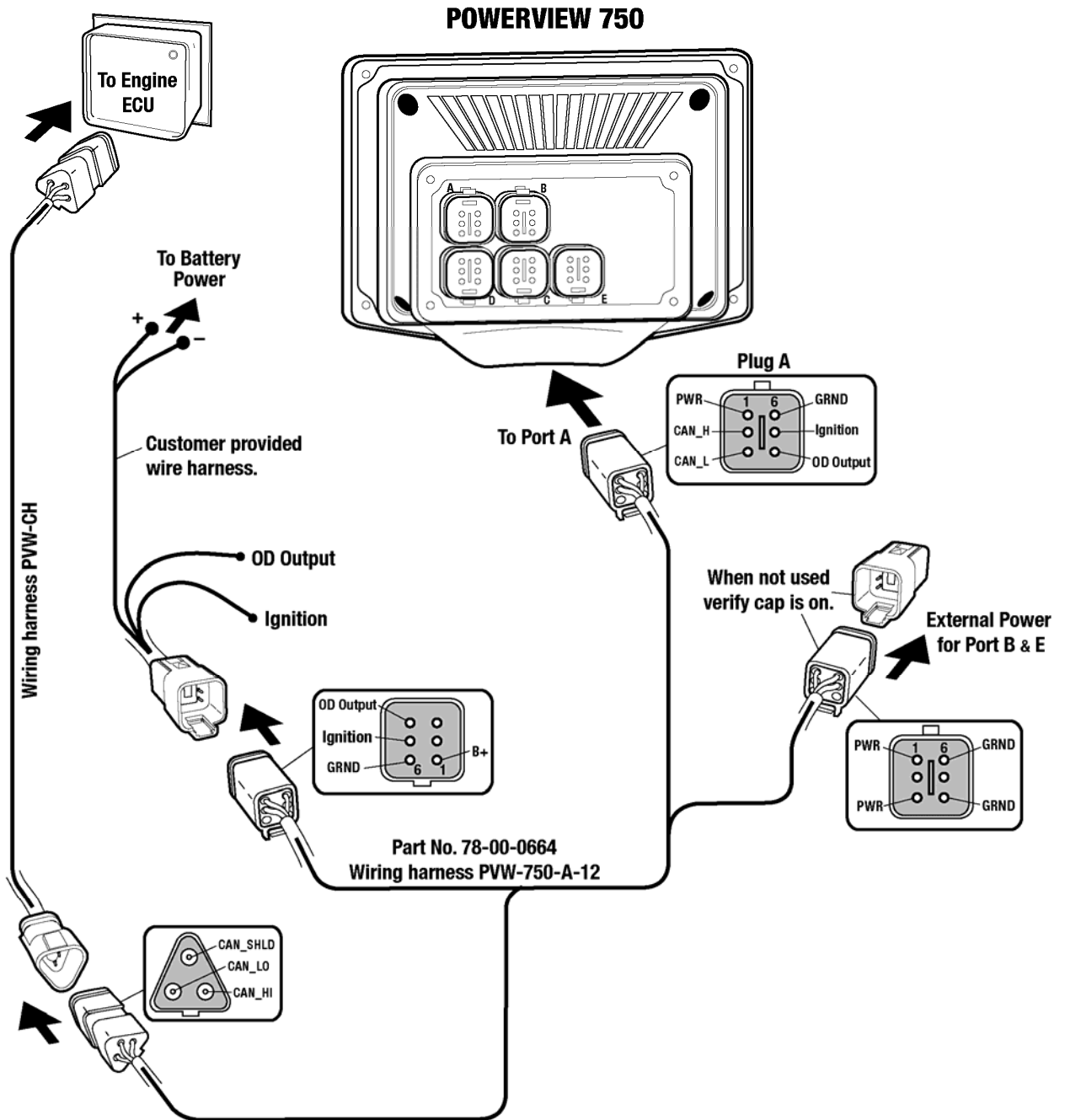
Flush Mounting the Dash

1. Cut the dash to allow for the display without bezel. Ensure x amount of materials is available to ensure the display is properly secured within the dash. Torque the 6-32 Nylock nuts to 5 inch pounds.

2. Place the display behind dash and line up the four mounting holes on the display with the holes in dash.

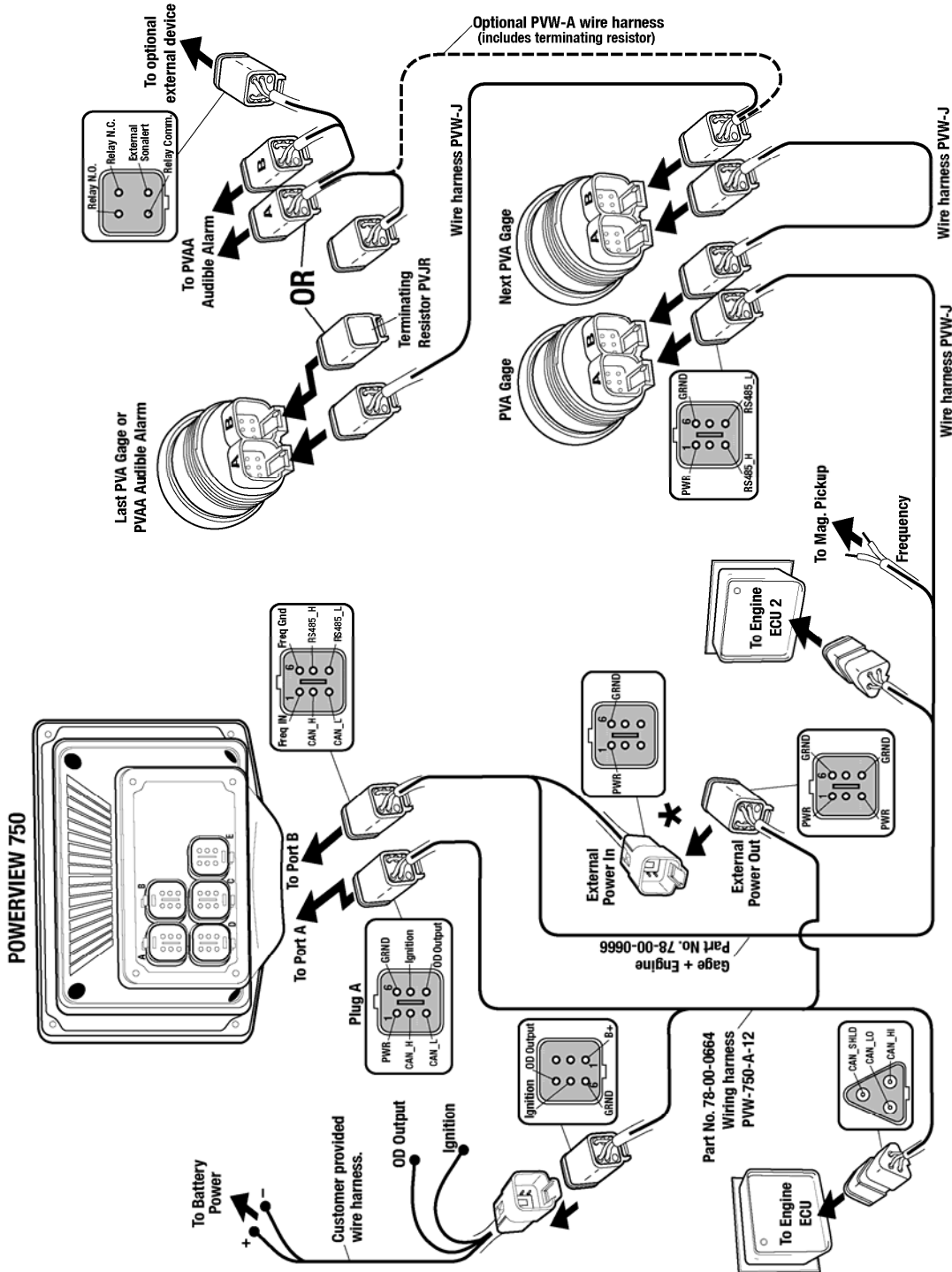3. Install four bolts and tighten nuts.

Wiring Instructions

The following illustrations are examples of various typical quick-connect options for setup. Wiring harnesses are sold separately.
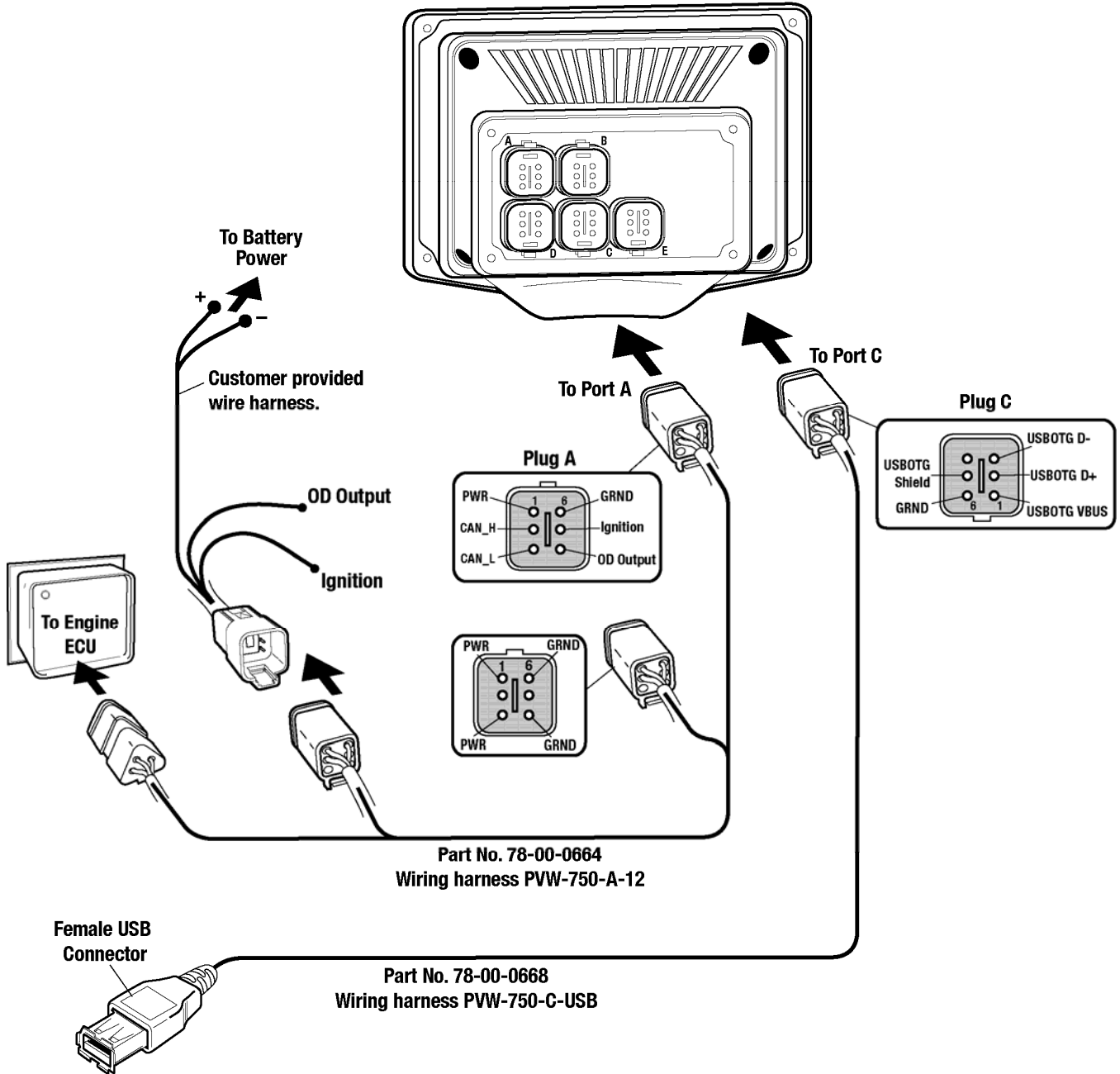
Single Engine

POWERVIEW 750

To Engine ECU

To Battery Power

+ −

Wiring harness PVW-CH

Customer provided wire harness.

OD Output

Ignition

OD Output
Ignition
GRND
6 1 B+

Part No. 78-00-0664
Wiring harness PVW-750-A-12

CAN_SHLD
CAN_LO
CAN_HI

To Port A

Plug A

PWR 1 6 GRND
CAN_H Ignition
CAN_L OD Output

When not used verify cap is on.

External Power for Port B & E

PWR 1 6 GRND
PWR GRND

PVA and Dual Engine Gages

NOTE: Port B and C connectors are keyed differently than Port A and D connectors to ensure proper connection.
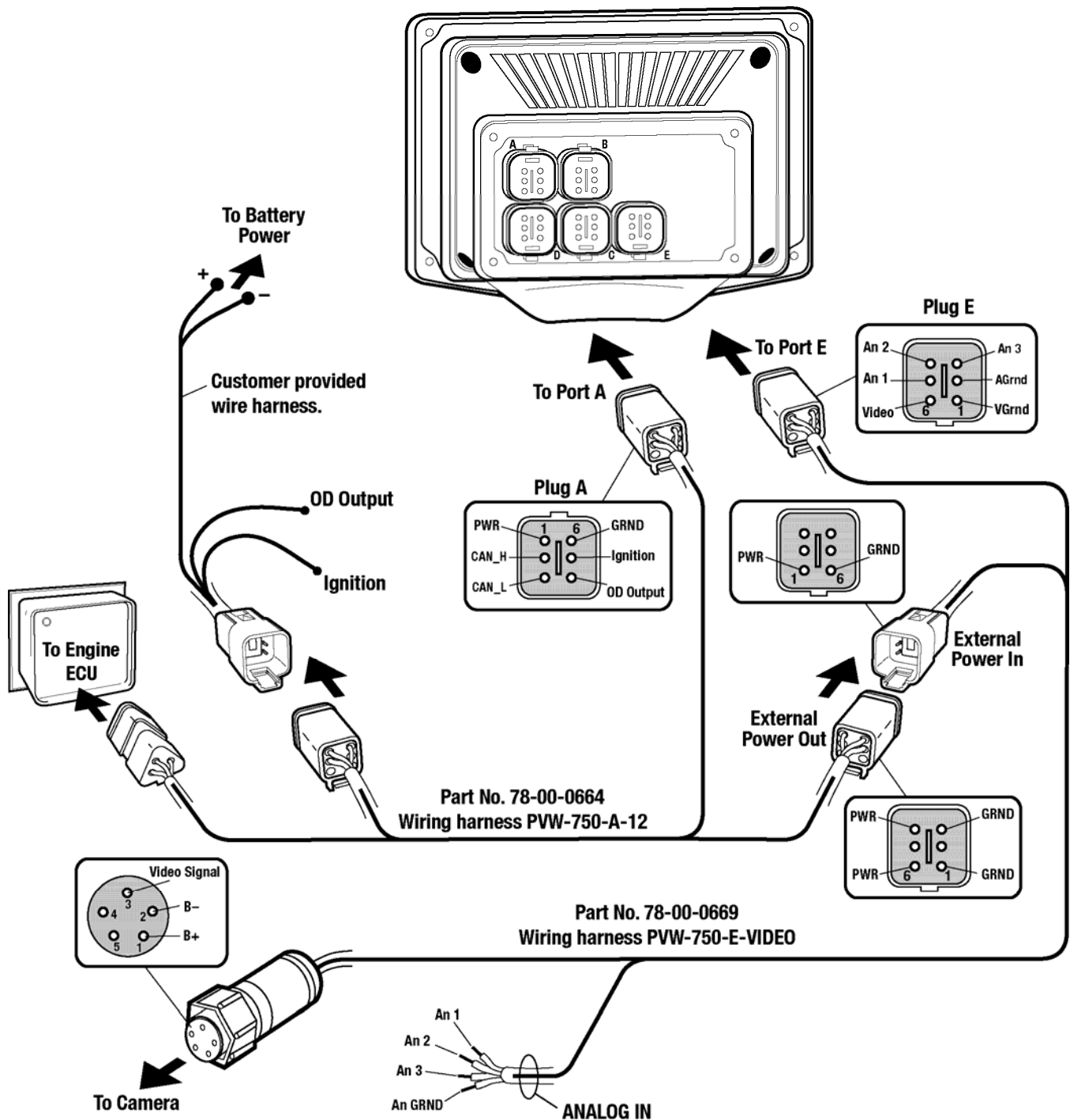If both PVA gages and Video camera are going to be utilized, an extra harness is needed. P/N 78000688 PVW-750-MINI
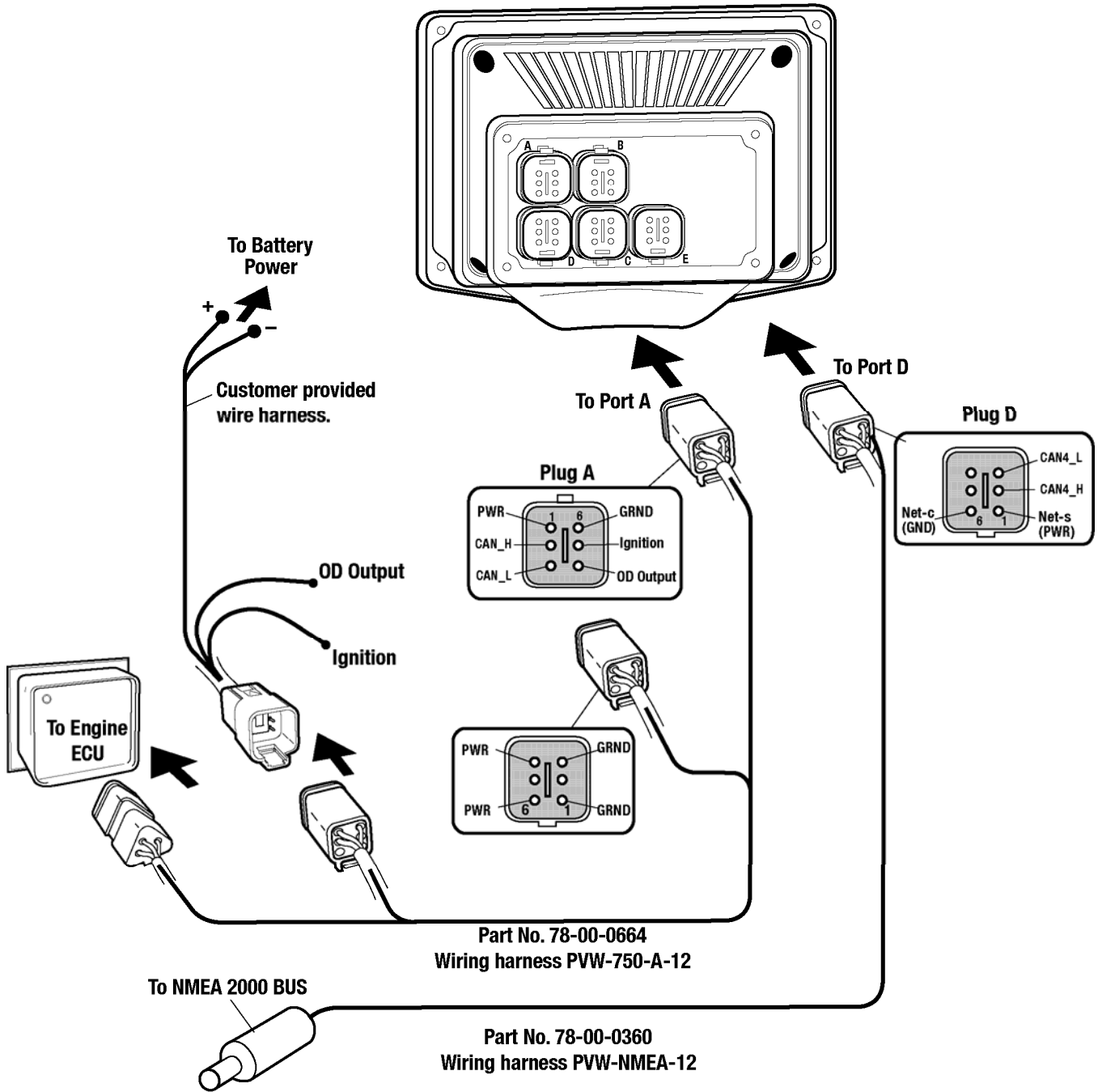
USB Wiring

POWERVIEW 750

To Battery Power

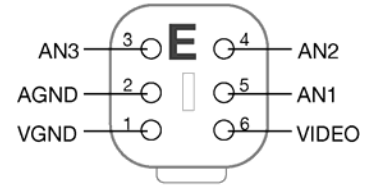+ −

Customer provided wire harness.

OD Output

Ignition

To Engine ECU

To Port A

To Port C

Plug A

PWR	1	6	GRND
CAN_H			Ignition
CAN_L			OD Output

PWR — GRND
1 6
PWR — GRND

Plug C

USBOTG Shield
GRND
USBOTG D−
USBOTG D+
USBOTG VBUS
6 1

Part No. 78-00-0664
Wiring harness PVW-750-A-12

Female USB Connector

Part No. 78-00-0668
Wiring harness PVW-750-C-USB

POWERVIEW 750

To Battery Power

+ −

Customer provided wire harness.

OD Output

Ignition

To Engine ECU

To Port A

To Port E

Plug E

An 2 — An 3
An 1 — AGrnd
Video — 6   1 — VGrnd

Plug A

PWR — 1   6 — GRND
CAN_H — — Ignition
CAN_L — — OD Output

PWR — GRND
1   6

External Power In

External Power Out

PWR — GRND
PWR — 6   1 — GRND

Part No. 78-00-0664
Wiring harness PVW-750-A-12

Video Signal
3
4   2 — B−
2 — B+
5   1

Part No. 78-00-0669
Wiring harness PVW-750-E-VIDEO

To Camera
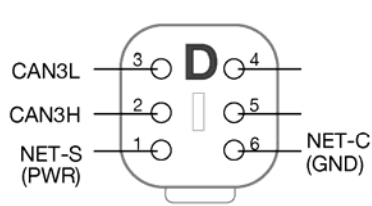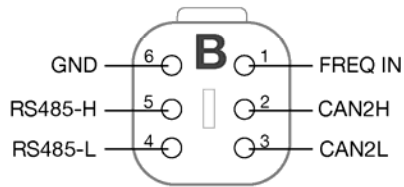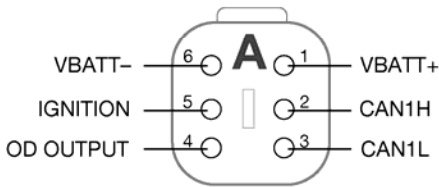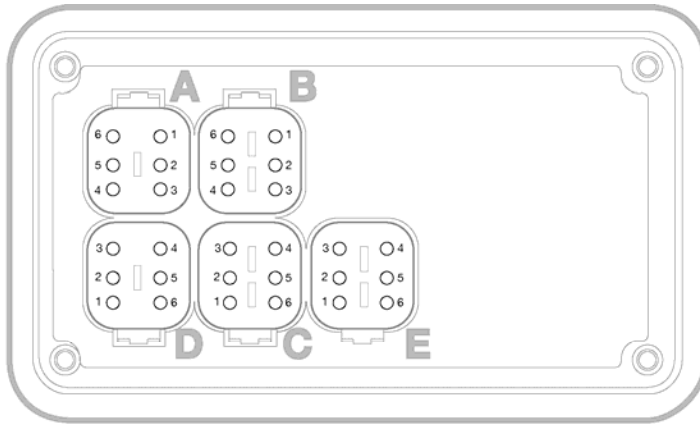
An 1
An 2
An 3
An GRND

ANALOG IN

NOTE: If both PVA gages and video camera are going to be utilized, an extra harness is needed. P/N 78000688 PVW-750-MINI.

POWERVIEW 750

To Battery Power

+ −

Customer provided wire harness.

To Port A

To Port D

Plug A

PWR — 1 6 — GRND
CAN_H — Ignition
CAN_L — OD Output

Plug D

CAN4_L
CAN4_H
Net-c (GND) — 6 1 — Net-s (PWR)

OD Output

Ignition

To Engine ECU

PWR — GRND
PWR — 6 1 — GRND

Part No. 78-00-0664
Wiring harness PVW-750-A-12

To NMEA 2000 BUS

Part No. 78-00-0360
Wiring harness PVW-NMEA-12

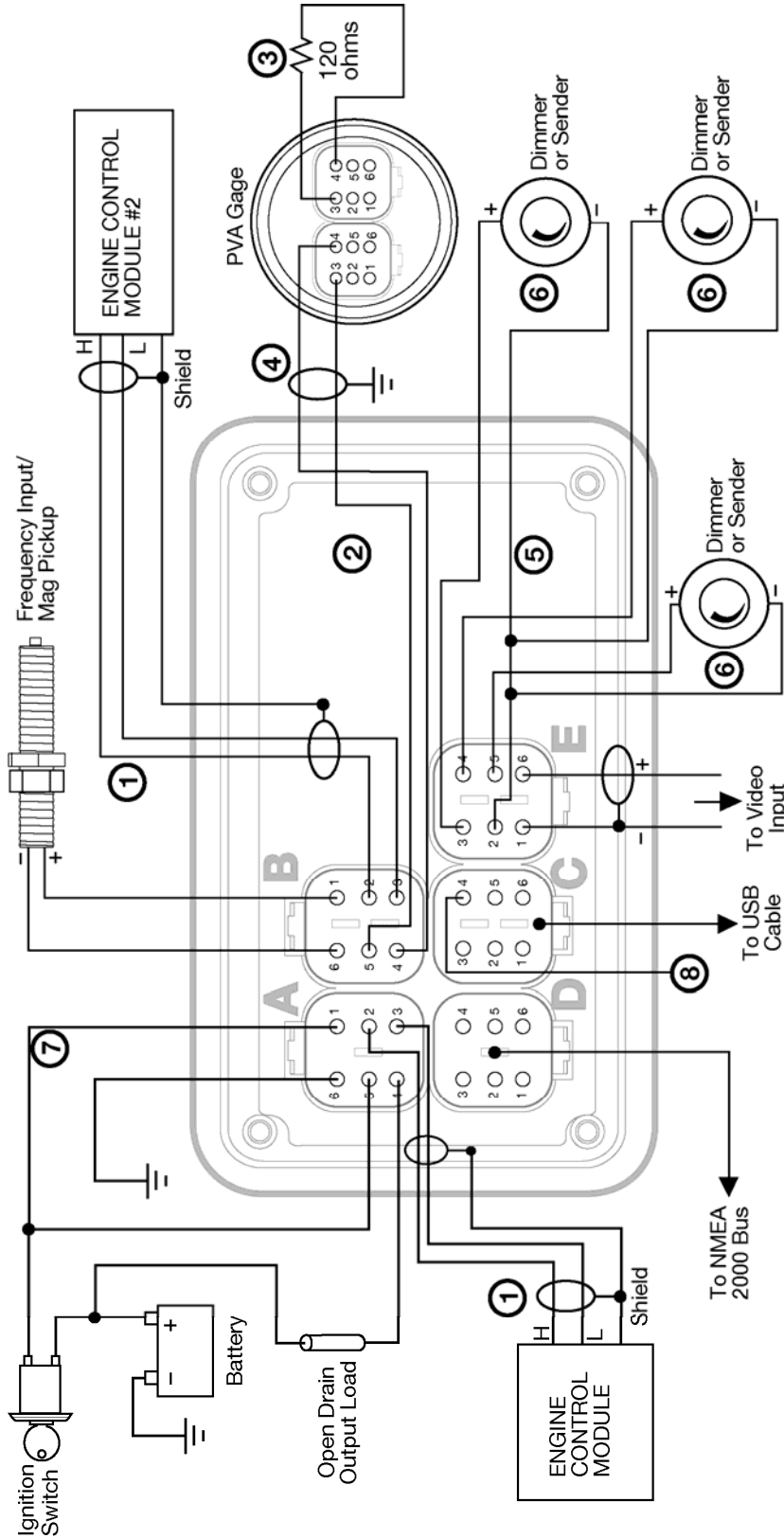# Pin Specifications for Deutsch DT04-6P Style Connections
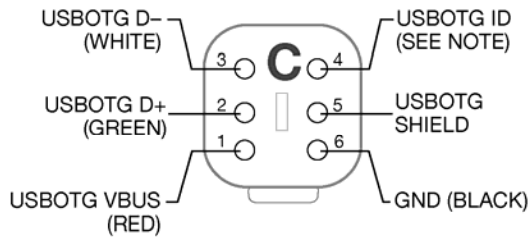
NOTE: GND to use as host, FLOAT to use as device (not currently supported).

Signal Definitions

CAN: 3 ports according to CAN specification 2.; 1 port isolated according to NMEA 2000 USB 2.0 host Video input (optional): NTSC/PAL Inputs (3) 0-5 VDC analog inputs, (1) input configurable to support measurement frequencies from 2 Hz - 10kHz values from 0-100% duty cycle Output: Digital, capable of sinking 500mA.

Wiring Schematic

ENGINE CONTROL MODULE #2

PVA Gage

120 ohms

Frequency Input/ Mag Pickup

Shield

Dimmer or Sender

Dimmer or Sender

Dimmer or Sender

To Video Input

To USB Cable

To NMEA 2000 Bus

Shield

ENGINE CONTROL MODULE

Ignition Switch

Battery

Open Drain Output Load

NOTE 1: Use SAE J1939 compliant wiring/equipment.

NOTE 2: Only use 120 ohm characteristic impendance cable, example, Belden 9841.

NOTE 3: Last gage should be terminated with 120 ohm terminating resistor.

NOTE 4: RS485 cable shield should be grounded at a point only near the PV750.

**NOTE 5**: Analog input ground should split off to separate wires near the PV750.

NOTE 6: If any analog input is not used, connect the blue signal wire to ground pin 2.

NOTE 7: UBATT may optionally be connected directly to the positive battery terminal if the ignition line is switched through the ignition.

NOTE 8: GND to use as host, FLOAT to use as device (not currently supported).

NOTE: CAN busses on plug A and B have internal selectable terminating resistors configured by software.

PV750 Features and Operations
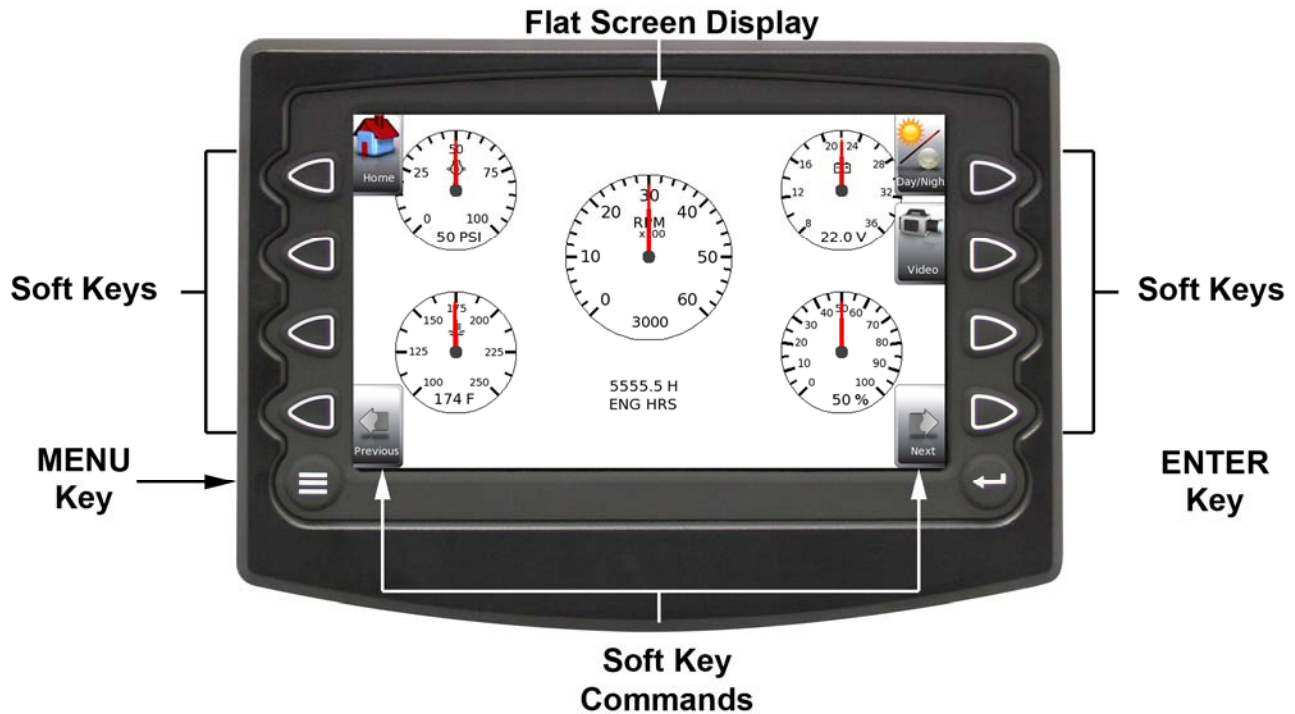
Flat Screen Display

A color screen displays gauges, soft key commands, and fault messages, as well as menu options for setup and configuration.

Soft Key Commands

Columns of vertical commands may be located to the left and/or right of the display. They will change according to the options available for the screen being displayed.

Soft Keys

The soft keys correspond to the soft key commands and allow you to make selections accordingly.

MENU Key

Pressing the **MENU** key at any time displays the list of menu options.

ENTER Key

Pressing the ENTER key will select the option displayed much like the ENTER key on a keyboard. The ENTER key also brings up the soft keys. Press once to display the left and right arrows. Press twice to display all the soft keys. Press three times to hide all the soft keys.

Setting Up your PV750 Display for the First Time

The guidelines presented below are intended for setting up the PV750 display for the first time. Once the configuration is set up, there is no need to revisit or change any of the settings.

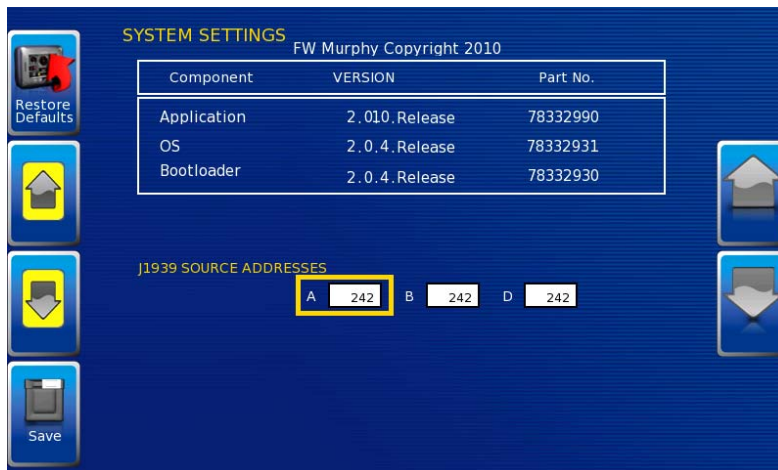> **NOTE:** If you require assistance during the set up process, contact FW Murphy customer support at (918) 317-4100.

1. At the main menu, press the soft key to the left of 'Utilities'.

2. The Utilities sub-menu is displayed.

3. From the 'Utilities' sub-menu, select 'System Settings'. The following screen is displayed.

4. With the cursor highlighting the J1939 source addresses, use the left side soft keys to scroll through the ports and the right side soft keys to change the address. Press the Save key to save selected changes or the Restore Defaults key to return to the default settings. The field options consist of the following:

Product Features

Power Up

The PowerView display is most frequently installed with power connected to the ignition. When the ignition is turned on, the PowerView display powers up and the engine health statistics can be viewed via preset gauges. To see more gauge screens, press the **Enter** key.

Main Menu

The main menu is activated at any time by pressing the **Menu** key on the display.

The following features are accessed through the main menu:

- **Gauge Display** – provides a series of screens that display engine and auxiliary information in a variety of formats.

- **Engine Diagnostics** – displays a list of engine fault codes and descriptions.

- **User Settings** – allows you to customize the display options for ambient light and brightness, set US or metric units, language, specify the Home screen and screen setup status.

- **Utilities** – allows configuration of the plug address. Also displays software version information at the top of the page.
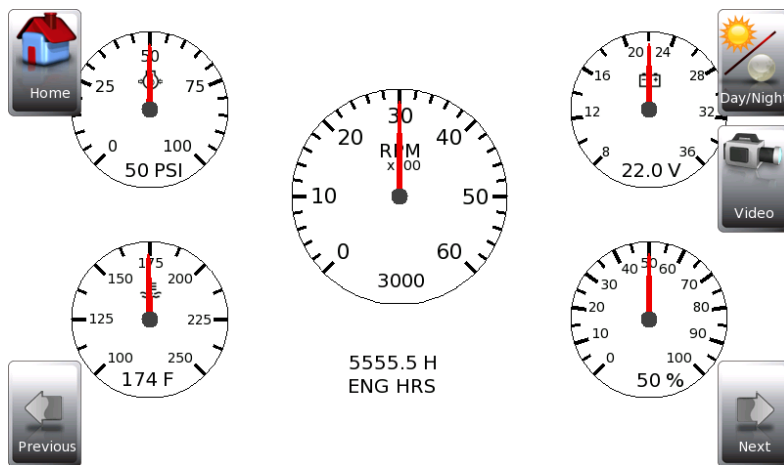
Gauge Display

The Gauge Display screen consists of several predefined layouts that contain combinations of analog gauges, straight bar gauges, or digital (text) readouts. These screens are displayed upon startup.

To scroll through the various gauge screens, press the **Prev** and **Next** soft keys. This can be repeated until all screens have been viewed. The currently displayed screen will stay active until another key is pressed.

Soft Key Commands

When a Gauge Display screen is active, pressing the **Enter** key will display soft key commands, as shown below. Continuing to press **Enter** will toggle through any additional soft keys, and will eventually remove the soft key commands from the screen.

Soft Key commands provide quick navigation and access to the following features:

- Video
- Day/Night
- Home
- Prev
- Next

Home - This one-touch navigation feature allows a pre-defined Home screen to be accessed from the available Gauge Display screens. Once selected, the Home screen will be displayed anytime the **Home** key is pressed.
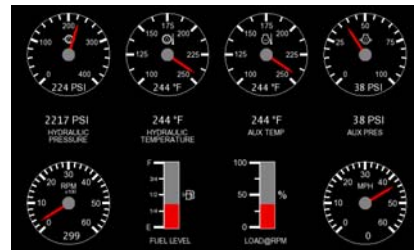
> **NOTE:** For instructions on how to setup the Home screen, refer to the **"User Settings"** section of this manual.

Day/Night - Allows you to toggle the display screen between Day View and Night View.

> **NOTE:** This feature can also be changed in the **"User Settings"** section of this manual.
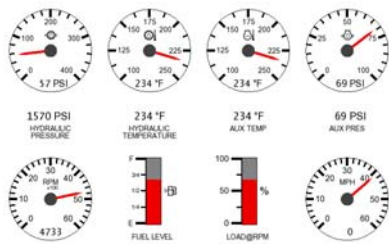
Day View

Night View

Video – When enabled, displays either full screen video or partial video within a window on the gauge display.

> **NOTE**: For instructions on how to enable full or partial screen video, refer to the **"User Settings"** section of this manual.
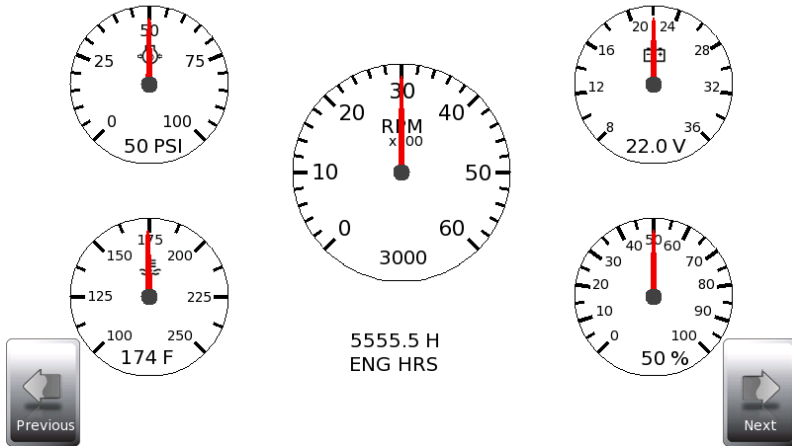

Full Screen Video

Example Partial Screen Video

(Video Screen displayed is from custom configuration)

.**Previous** and **Next** keys allow you to scroll through and display the various gauge screens.

NOTE: For instructions on how to turn screens ON or OFF, refer to the **"User Settings"** section of this manual.
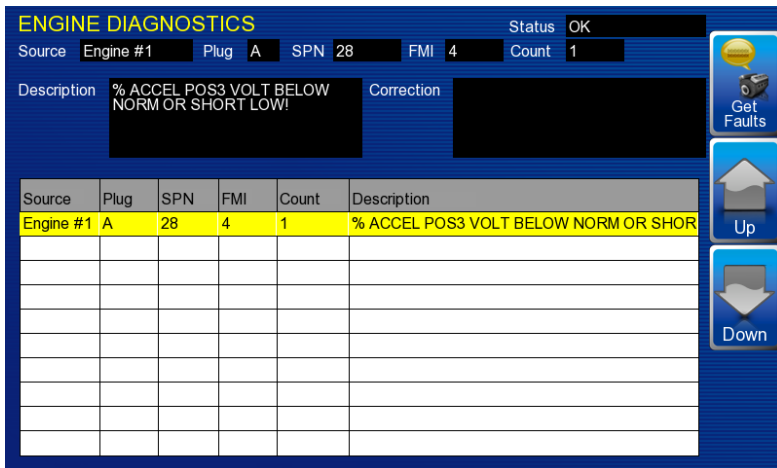
Engine Diagnostics

Choosing Engine Diagnostics from the Menu, the display will query the engine(s) ECU and provide feedback on any diagnostic codes that have been activated and stored in the ECU for service needs.

The Engine Diagnostics option displays faults based on engine or auxiliary source.

The following is a list of field definitions contained on the Engine Diagnostics screen:

- **Source** – identifies the component having the fault; engine 1, 2, or auxiliary.

- **Status** – indicates whether the fault has been corrected.

- **SPN** –"Suspect Parameter Number" - fault code
  If not translated into text by the PV750 display, see the engine manufacturer's literature for the definition of the SPN number.

- **FMI** – "Failure Mode Indicator" - fault code
  The FMI is defined by SAE J1939. If not translated into text, see the SAE standard, or the engine manufacturer's literature.

- **Count** – The number of times the event has been flagged.

- **Description** – Most common SPN's and FMI's have text for the description stored in the PV750 display. If there is no text, then this SPN and FMI must be defined by referring to the engine manufacturer, or the SAE J1939 standard.

- **Correction** – Trouble-shooting guidelines for corrective action to take in addressing the fault.

  NOTE: This field is only used with certain brands and models of engines.

Fault Code Popups

A fault condition will trigger a popup dialog box on the screen describing the nature of the fault. Corresponding red or amber fault lights on the corners of the unit are also activated to indicate the severity of the fault. The following screens are examples of warning and shutdown fault code popups.

How to Hide/Show Faults

To hide the fault code popup being displayed on the screen, press the soft key on the right next to the "Hide" icon. The popup will disappear, however the "Warning" or "Stop" icon will remain on the screen to indicate there is still a fault. Pressing "Hide" does not clear the fault; it only hides the popup message.

When a fault code has been hidden, a "Recall" icon will remain on the right side. When this soft key is pressed, the fault code will again be displayed. When a popup message has been activated, a pop-up message will be displayed until the alarm is acknowledged by pressing the "Hide" key.

Scrolling Through Multiple Messages

The title-bar of the fault code popup may indicate multiple messages, as in 'Diagnostic Message 1 of 3. Press the **Prev** and **Next** keys to scroll through the different messages.

User Settings

User Settings provides options to specify viewing preferences for the PV750 Display. Pressing **Up** and **Down** navigates through the options. To change an option, press the corresponding soft key next to the desired soft key command.
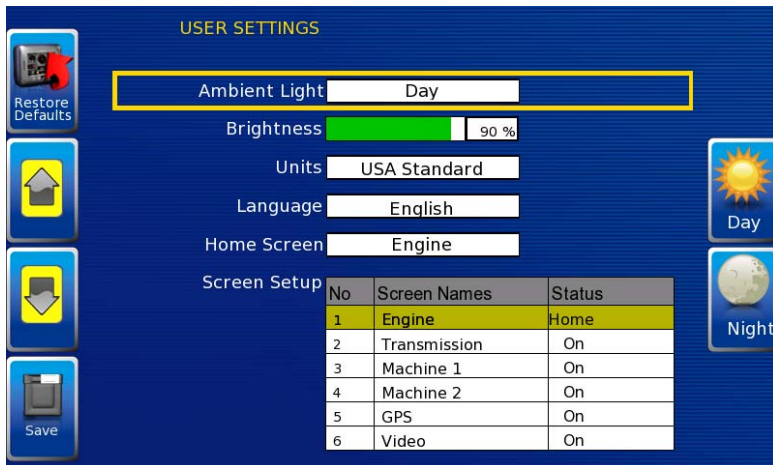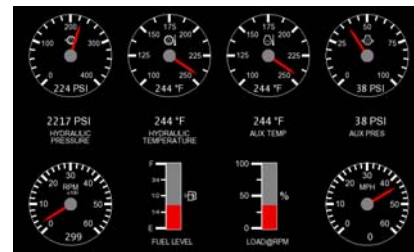

Ambient Light

Night and Day options are provided for ambient lighting. The screens below illustrate these options. When the ambient lighting settings are changed in User Settings, the power-on default is changed.
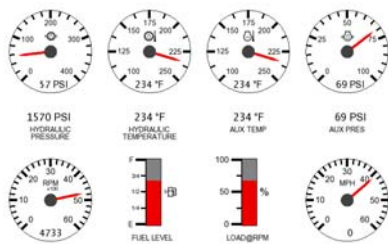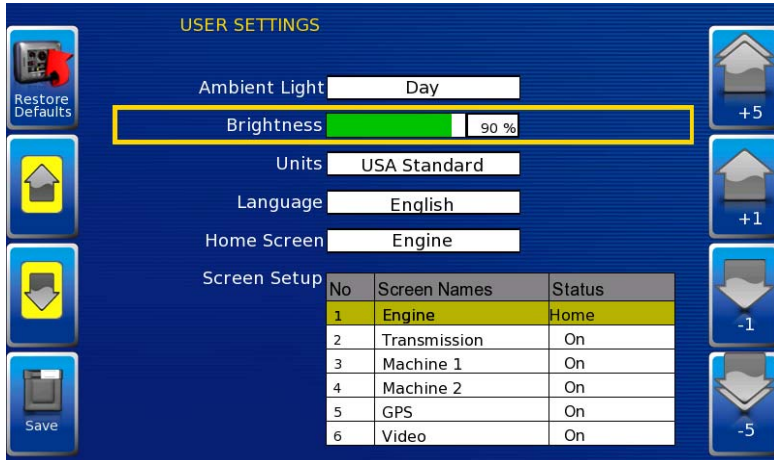

Day View   **Night View**

> **NOTE:** The ambient lighting option is also accessible through soft key commands on the gauge display screens. When selected, the **Day/Night** soft key toggles the display to the opposite mode.

Brightness

You can set the brightness control by using the soft keys to change the settings in +1% and +5% increments until the desired brightness is achieved.
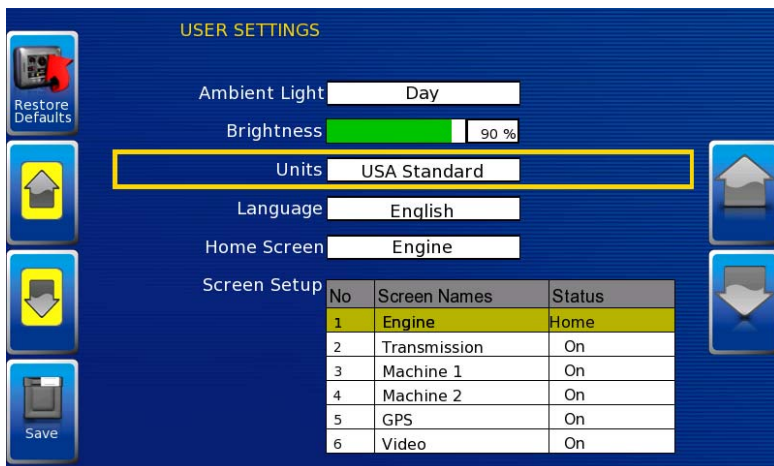

> **NOTE**: Brightness level will change with ambient light setting. Two brightness levels are saved; one for day and one for night.

Units

Select how units are displayed by using the soft keys to select from the following:

- USA Standard
- Metric Bar
- Metric kPa
- British Standard

Language

This option allows you to select the language that will be displayed on the PowerView. Available languages include English, French, Spanish, German, Italian, and Chinese. Languages are selected from the soft keys. Press **More** to view additional languages.
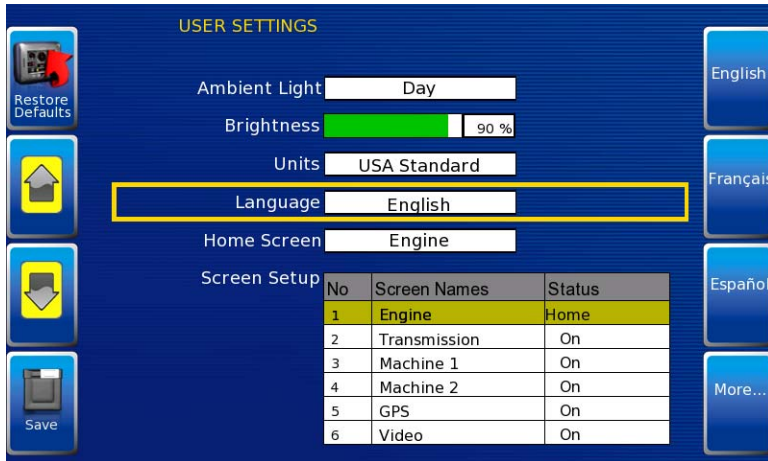

Home Screen

The Home Screen option allows you to specify a favorite screen from the Screen Names list that can be used as a shortcut back to that screen. The Home Screen will also be the first screen shown when Gauge Display is selected from the User Setting menu. Press the desired soft key to specify the Home Screen.
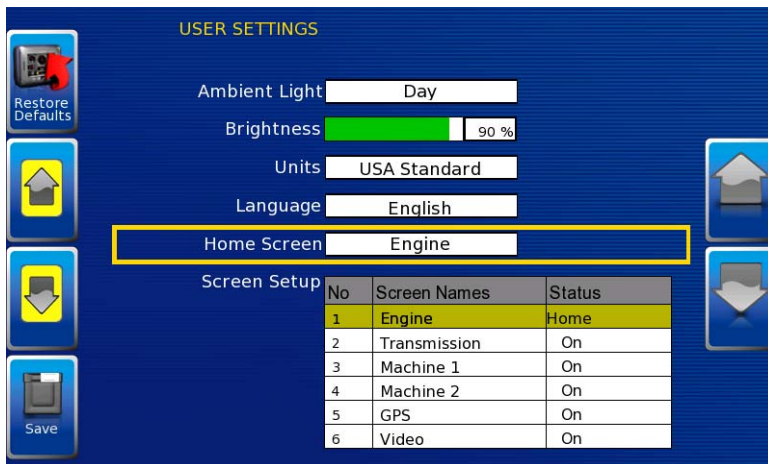
Screen Setup

The Screen Setup option provides a list of screens that may be shown when accessing the Gauge Display screens. The 'Status' field will indicate which screen has been specified as the HOME screen. It also provides the user the ability to turn the screens ON or OFF by pressing the **Enable/Disable** soft key. If a screen is turned OFF, it will not show up when Gauge Display is activated.
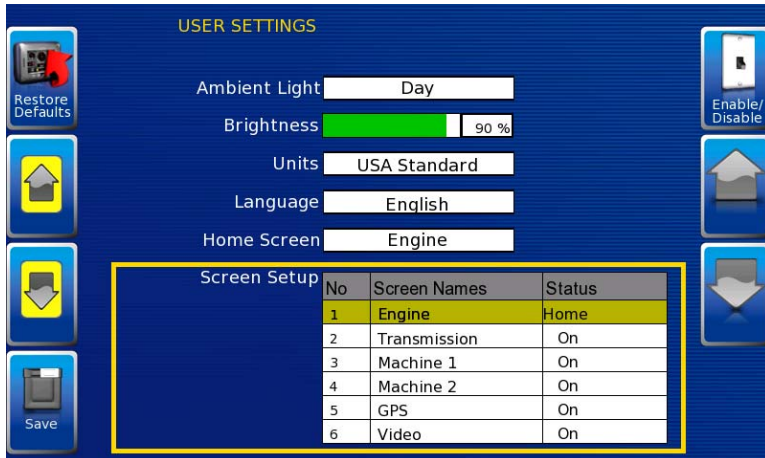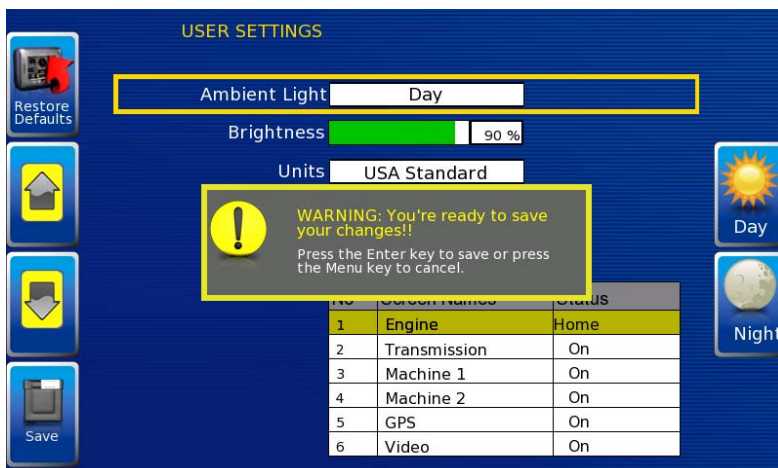

Video (Optional)

By default, the Video screen is on or 'Enabled'. To 'Disable' video, change Video option to 'Off' in the screen setup dialog box using the Enable/Disable key in the top right corner. An updated image showing video screen highlighted / off will be displayed.

Save

Once all changes have been made, press **Save**. The following confirmation screen is displayed.

Restore Defaults

Restore Defaults sets the display to the original factory settings. During troubleshooting, this can be used as a last resort to completely reset the display to a known state.

To restore the default user settings, press **Restore Defaults**. The following confirmation screen is displayed.
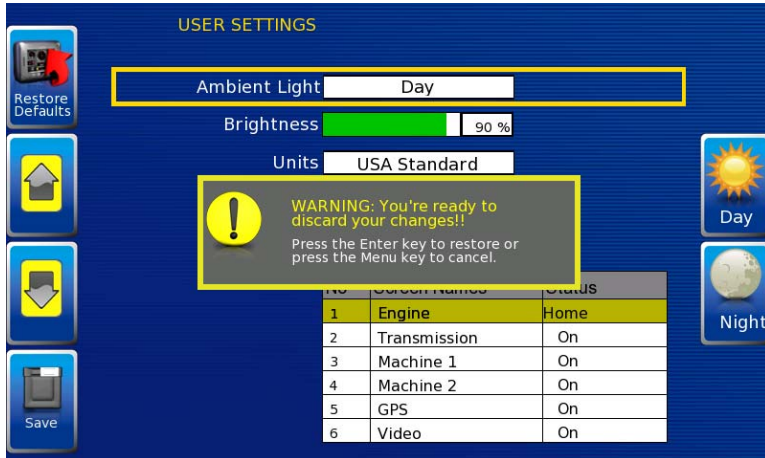
Utilities

Utilities allow you to reset external gauges and configure communication settings. It is typically only accessed when the unit is first installed in order to configure the unit. The following sub-menu is displayed when Utilities is selected.

System Settings

The System Settings screen displays the current software version loaded on the PV750 display. You can set individual settings for the available options and "**Save**", or choose to select "**Restore Defaults**" for the factory settings.
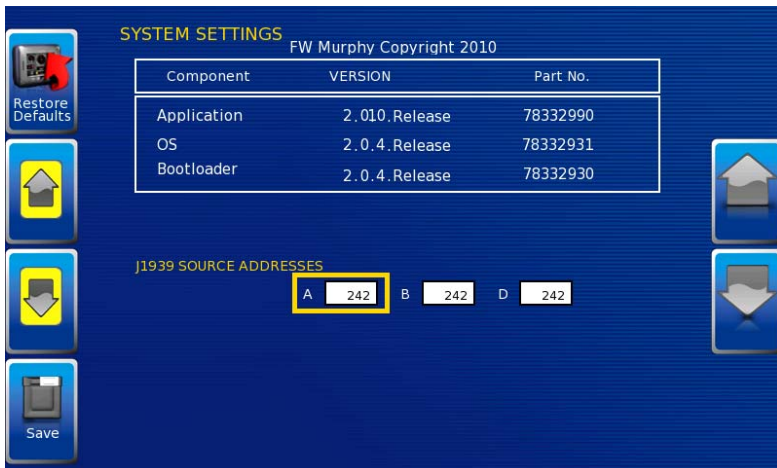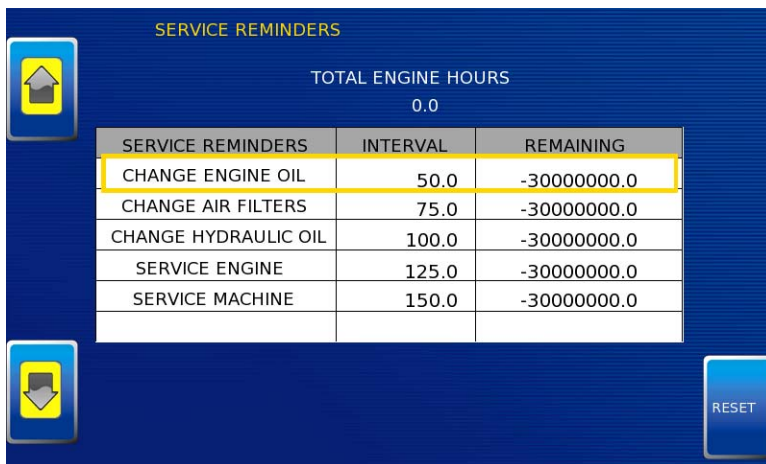

The yellow **Up** and **Down** keys on the left allow you to move the cursor through 'J1939 Source Addresses' fields. While the cursor is highlighting a field, the gray **Up** and **Down** keys scroll through available options. Once all the options have been selected, press **Save**.

Service Reminders

This option allows you to reset the 5 built-in service reminders:

- Change Engine Oil – Default interval 50.0 Hrs.

- Chang Air Filters – Default interval 75.0 Hrs.

- Change Hydraulic Oil – Default interval 100.0 Hrs.

- Service Engine – Default interval 125.0 Hrs.

- Service Machine – Default interval 150.0 Hrs.

Specifications

## Electrical

|	
Display	7" / 178mm color transmissive TFT LCD
Resolution	WVGA, 800 x 480 pixels, 16-bit color
Aspect Ratio	16:9
Orientation	Landscape or portrait
Backlighting	LED, 400-500 cd/mC (50,000 h lifetime)
Microprocessor	Freescale IMX.31 32bit, 400 MHz
Operating System	QNX operating system
Flash Memory	2 GB
RAM	128 Mbytes SDRAM
Operating Voltage	6 - 35 VDC, protected against reverse polarity and load-dump
Power Consumption	10 W full backlight 22 W full backlight with heater (< -10º C)
CAN	3 CAN ports according to CAN specification 2.0B. One port isolated according to NMEA 2000 (GPS)
RS-485	1 MODBUS Master port at 38.4 Kbaud
Protocols	J1939, NMEA 2000
Connection	5 Deutsch DT04-6P 6-pin connectors
Keyboard	10 tactile buttons
USB	USB 2.0 host (full speed)
Inputs	(3) 0-4 VDC analog inputs. (1) input configurable to support measurement frequencies from 2 Hz-10 kHz
Video Input (optional)	NTSC/PAL
Output	Digital, capable of sinking 500mA
SD Storage (optional)	For program updates, map data, diagnostic data storage

Environmental

Operating Temperature	-40º C to +85º C
Storage Temperature	-40º C to +85º C
Protection	IP67, front and back
Emissions	IEC 60945, 95/54/EC
Immunity	SAE J1113, ISO 11452
Vibration	Random vibration, 7.86 Grms (5.2000 Hz), 3 axis
Shock	+/- 50G in 3 axis

Mechanical

Dimensions	(W x H) 8.37 x 6.0 in (212.5 x 152.3mm) landscape Unit Depth – 3.57 in (90.8mm)
Shipping Weight	Approximately 2.5 lbs. (1.13 kg)
Case Material	Polycarbonate back case
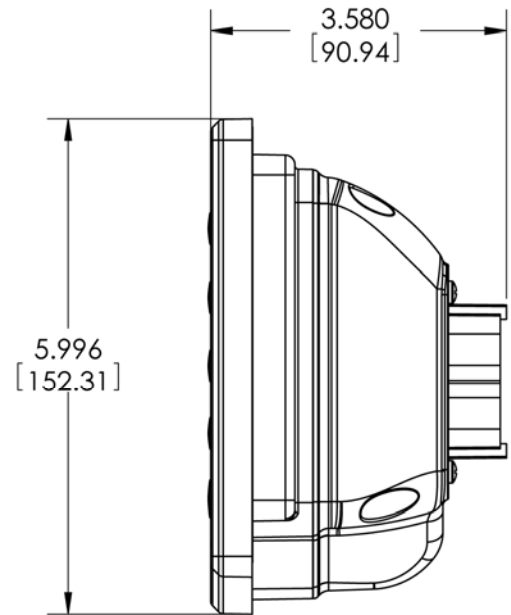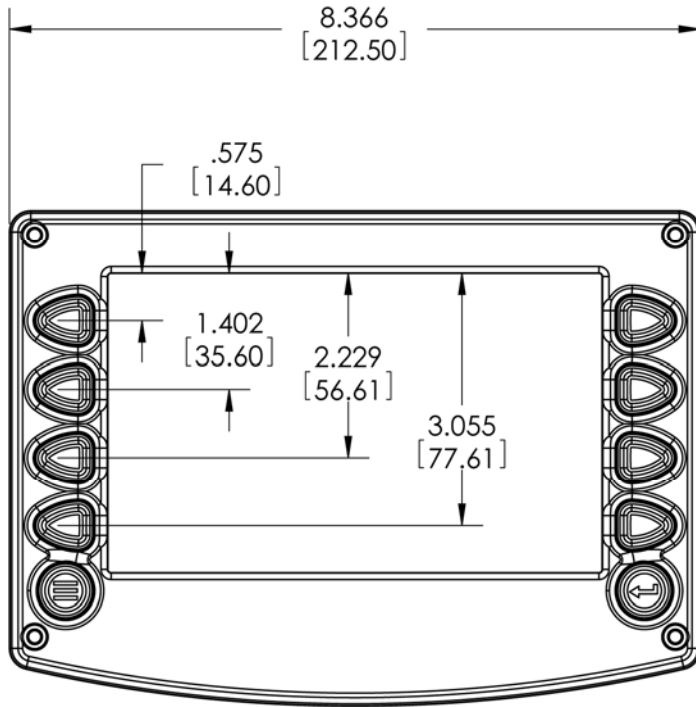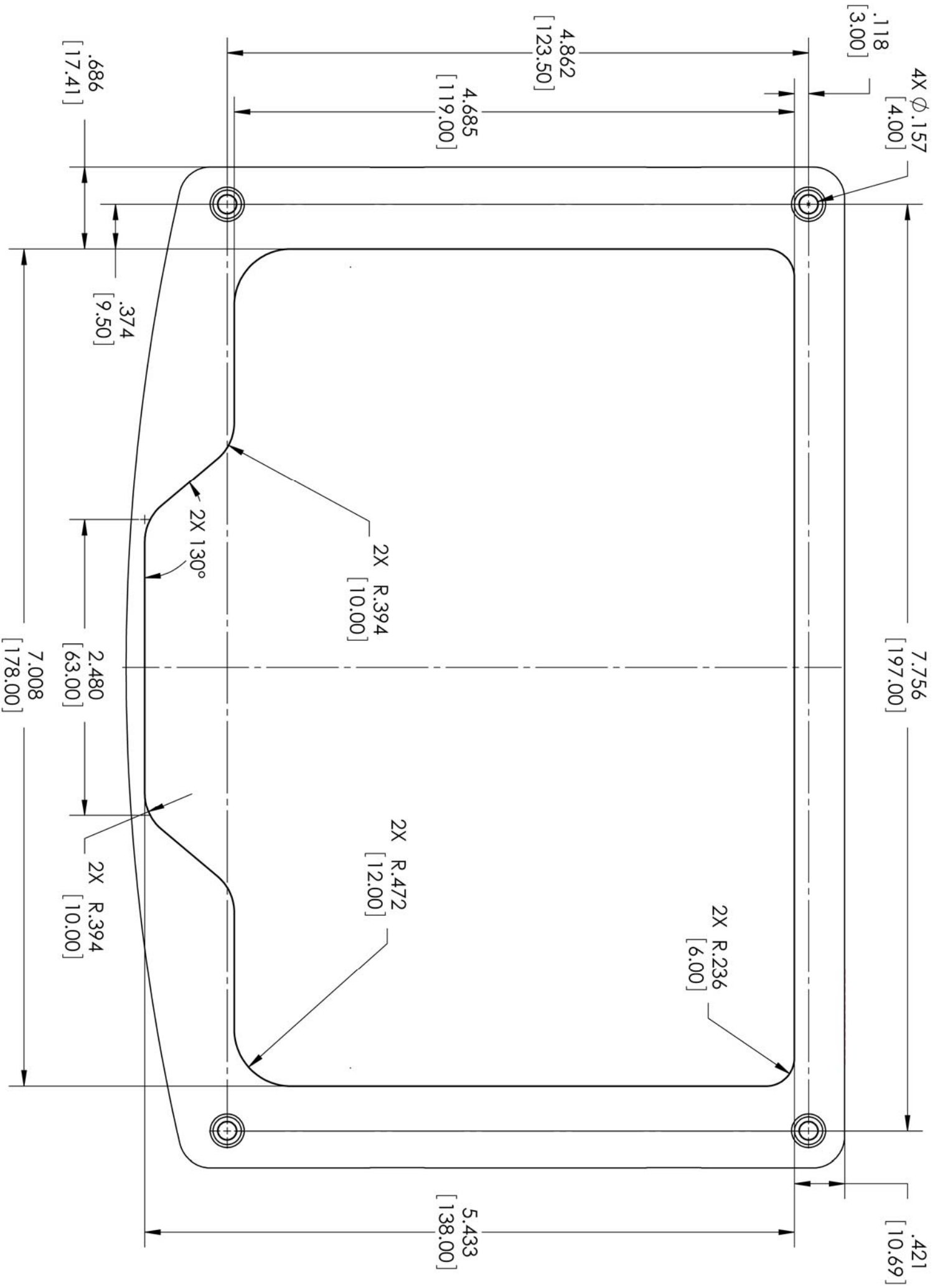
FW MURPHY
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
Phone: +1 918 317 4100 Fax: +1 918 317 4266
E-mail: sales@fwmurphy.com

INDUSTRIAL PANEL DIVISION
Fax: +1 918 317 4124
E-mail: ipdsales@fwmurphy.com

MURPHY POWER IGNITION
Web site: www.murphy-pi.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819
Rosenberg, Texas 77471 USA
Phone: +1 281 633 4500 Fax: +1 281 633 4588
E-mail: css-solutions@fwmurphy.com

FRANK W. MURPHY LTD.
Church Road, Laverstock
Salisbury, SP1 1QZ, UK
Phone: +44 1722 410055 Fax: +44 1722 410088
E-mail: sales@fwmurphy.co.uk
Web site: www.fwmurphy.co.uk

COMPUTRONIC CONTROLS
41 - 46 Railway Terrace
Nechells, Birmingham, B7 5NG, UK
Phone: +44 121 327 8500 Fax: +44 121 327 8501
E-mail: sales@computroniccontrols.com
Web site: www.computroniccontrols.com

www.fwmurphy.com

FW MURPHY INSTRUMENTS (HANGZHOU) CO., LTD.
77 23rd Street
Hangzhou Economic & Technological Development Area
Hangzhou, Zhejiang, 310018, China
Phone: +86 571 8788 6060 Fax: +86 571 8684 8878
E-mail: apsales@fwmurphy.com

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